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12/27/2000

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02/25/2004

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EXAMINER

TABATABAI, ABOLFAZL

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/748,384

Applicant(s)

OOSAWA, AKIRA

Examiner

Abolfazl Tabatabai

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

### **Response to Amendment/Arguments**

1. Applicant's arguments, (pages 13-17), filed on December 9, 2003 with respect to the rejection(s) of claim(s) 1-52 under *Nachtomy et al* (U S 6,095,976) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of *Some et al* (U S 5,841,148); *Branson* (U S 5,740,801); *Ishihara* (5,241,473) and *Gupta et al* (6,292,683 B1).

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 7, 13, 22, 23, 26, 32, 38, 47-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Some et al* (U S 5,841,148) in view of *Branson* (U S 5,740,801).

Regarding claim 1, *Some* discloses image-processing apparatus comprising the steps of:

performing inter-image processing on two original images constituting each of two or more pairs of original images selected from three or more original images taken of the same subject, which become objects of comparison and reading (column 4, lines 1-32; column 11, lines 28-37 and column 13, lines 47-58).

However, Some is silent about the specific details regarding the step of:

arranging, or switching in sequence, and displaying two or more inter-image processed images generated by said inter-image processing.

In the same field of endeavor, however, Branson discloses managing information endoscopy system comprising the step of:

arranging, or switching in sequence, and displaying two or more inter-image processed images generated by said inter-image processing (column 2, lines 47-55).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use arranging, or witching in sequence, and displaying two or more inter-image processed as taught by Branson in the system of Some because Branson provides Some a system which performs a zooming function for increasing size of images on the output device and reduces interlaced noise on an interlaced video display device by reducing motion artifacts due to motion that occurs between acquisition of field of video that comprise a video frame.

Regarding claim 7, Some discloses image processing apparatus wherein one of said two original images is selected as a reference image so that each of said inter-image-processed images is generated based on said image (column 4, lines 1-26).

Regarding claim 13, Some discloses image processing apparatus wherein said inter-image processing is the process of performing subtraction between corresponding pixels in said two original images (column 5, lines 19-23 and column 11, lines 59-64).

Claim 22, is similarly analyzed as claim 1.

Regarding claim 23, Some discloses image processing apparatus wherein said three or more images are medical radiation images (column 12, lines 47-51 and column 15, lines 14-40).

Regarding claim 26, Some discloses image-processing apparatus comprising the steps of:

Image display means (column 10, lines 21-37);

Inter-image processing means for performing inter-image processing on two original images constituting each of two or more pairs of original images selected from three or more original images taken of the same subject, which become objects of comparison and reading (column 4, lines 1-32; column 11, lines 28-37 and column 13, lines 47-58).

However, Some is silent about the specific details regarding the step of:

display-format setting means for causing said image display means to arrange, or switch in sequence, and displaying two or more inter-image processed images obtained by said inter-image processing means.

In the same field of endeavor, however, Branson discloses managing information endoscopy system comprising the step of:

display-format setting means for causing said image display means to arrange, or switch in sequence, and displaying two or more inter-image processed images obtained by said inter-image processing means (column 2, lines 47-55; column 7, lines 41-51 and column 8, lines 9-16).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use display-format setting means for causing said image display means to arranging, or witching in sequence, and displaying two or more inter-image processed as taught by Branson in the system of Some because Branson provides Some a system which performs a zooming function for increasing size of images on the output device and reduces interlaced noise on an interlaced video display device by reducing motion artifacts due to motion that occurs between acquisition of field of video that comprise a video frame.

Claim 32 is similarly analyzed as claim 7.

Claim 38 is similarly analyzed as claim 13.

Claim 47, is similarly analyzed as claim 22.

Claim 48, is similarly analyzed as claim 23.

Claims 49-52 are similarly analyzed as claims 1 and 26 above.

4. Claims 11 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Some et al (U S 5,841,148) and Branson (U S 5,740,801) as applied to claims 7 and 32 above, and further in view of Ishihara et al (5,241,473).

Regarding claim 11, Some and Branson are silent about the specific details regarding three or more original images are acquired in sequence in a time series manner, and said reference image is the newest or oldest in a time series.

In the same field of endeavor, however, Ishihara discloses a system for tracking motion in MR images comprising three or more original images are acquired in sequence in a

time series manner, and said reference image is the newest or oldest in a time series (column 3, lines 34-38; column 12, lines 65-68; column 13, lines 1-8 and 26-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use reference image as taught by Ishihara in the system of Some because Ishihara provides Some a system in which the foregoing problems are solved in which movement of moving portion of patient's body such as a heart of blood vessels are depicted with colored differential images and display in a time series of the moving portion of the patient's body on a scope is produced, and is further possible to discriminate timing of the images relative to a biosignal of the patient.

Claim 36, is similarly analyzed as claim 11.

5. Claims 2-6, 8-10,12, 14-21,24-25, 27-31, 33-35, 37 and 40-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Some et al (U S 5,841,148) and Branson (U S 5,740,801) as applied to claims 1 and 26 above, and further in view of Gupta et al (6,292,683 B1).

Regarding claim 2, Some and Branson are silent about the specific details regarding the image display method wherein said two or more inter-image-processed images are arranged in a manner in which display positions of structurally characteristic parts of said subject in said two or more inter-image-processed images are aligned. In the same field of endeavor, however, Gupta discloses a system for tracking motion in MR images comprising the image display method wherein said two or more inter-image-processed images are arranged in a manner in which display positions of structurally

characteristic parts of said subject in said two or more inter-image-processed images are aligned (column 6, lines 29-39 and column 9, lines 51-59).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use alignment as taught by Gupta in the system of Some. Because Gupta provides Some a system to track movement in MR images that solves the aforementioned problems. In one application, an automatic image registration algorithm is proposed which greatly reduces the time required for analyzing MR studies and improves the accuracy of signal intensity analysis. This automatic image registration system is particularly advantageous in myocardial perfusion imaging, coronary artery imaging diffusion system, and medical instrument tracking in an interventional procedure.

Regarding claim 3, Some and Branson are silent about the specific details regarding two or more inter-image-processed images are switched in sequence in a manner in which display positions of structurally characteristic parts of said subject in said two or more inter-image-processed images are registered.

In the same field of endeavor, however, Gupta discloses a system for tracking motion in MR images comprising two or more inter-image-processed images are switched in sequence in a manner in which display positions of structurally characteristic parts of said subject in said two or more inter-image-processed images are registered (column 4, lines 17-26 and column 6, lines 25-56).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use registered images as taught by Gupta in the system of Some.



Because Gupta provides some a system to track movement in MR images that solves the aforementioned problems. In one application, an automatic image registration algorithm is proposed which greatly reduces the time required for analyzing MR studies and improves the accuracy of signal intensity analysis. This automatic image registration system is particularly advantageous in myocardial perfusion imaging, coronary artery imaging diffusion system, and medical instrument tracking in an interventional procedure.

Regarding claim 4, Some and Branson are silent about the specific details regarding three or more original images are taken in sequence in a time series manner. In the same field of endeavor, however, Gupta discloses a system for tracking motion in MR images comprising three or more original images are taken in sequence in a time series manner (column 3, lines 27-33 and column 6, lines 29-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use time series manner as taught by Gupta in the system of Some because Gupta provides Some a system to track movement in MR images that solves the aforementioned problems. In one application, an automatic image registration algorithm is proposed which greatly reduces the time required for analyzing MR studies and improves the accuracy of signal intensity analysis. This automatic image registration system is particularly advantageous in myocardial perfusion imaging, coronary artery imaging diffusion system, and medical instrument tracking in an interventional procedure.

Claims 5 and 6 are similarly analyzed as claim 4.

Claims 8-10 are similarly analyzed as claim 7.

Claim 12, is similarly analyzed as claim 4.

Claim 14, is similarly analyzed as claim 13.

Claim 15, is similarly analyzed as claim 13.

Regarding claim 16, Some and Branson are silent about the specific details regarding inter-image processing is the process of registering positions of structural elements of said two original images.

In the same field of endeavor, however, Gupta discloses a system for tracking motion in MR images comprising inter-image processing is the process of registering positions of structural elements of said two original images (column 4, lines 20-26 and column 6, lines 29-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use registering positions as taught by Gupta in the system of Some because Gupta provides Some a system to track movement in MR images that solves the aforementioned problems. In one application, an automatic image registration algorithm is proposed which greatly reduces the time required for analyzing MR studies and improves the accuracy of signal intensity analysis. This automatic image registration system is particularly advantageous in myocardial perfusion imaging, coronary artery imaging diffusion system, and medical instrument tracking in an interventional procedure.

Claims 17-21 are similarly analyzed as claim 16.

Claims 24 and 25 are similarly analyzed as claim 12.

Claim 27, is similarly analyzed as claim 2.

Claim 28, is similarly analyzed as claim 3.

Claims 29-31, 36-37 are similarly analyzed as claim 4.

Claim 33, is similarly analyzed as claim 7.

Claim 34, is similarly analyzed as claim 28.

Claim 35, is similarly analyzed as claim 29.

Claim 37, is similarly analyzed as claim 25.

Claims 39 and 40 are similarly analyzed as claim 13.

Claims 41-46 are similarly analyzed as claim 16.

### **Other prior art Cited**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Taniguchi (U S 5,578,823) discloses a transmission electron microscope and method of observing element distribution by using the same.

Fujii et al (U S 5,594,768) disclose a laminograph and inspection and repair device using the same

Ishihara et al (U S 6,110,123) disclose a region of interest setting apparatus for respiration monitoring and a respiration monitoring system.

Yonekawa (U S 6,504,897 B1) disclose a X-ray image radiographing

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system.

### **Contact Information**

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (703) 308-5246. The fax phone number for organization where this application or proceeding is assigned is (703) 872-9306.

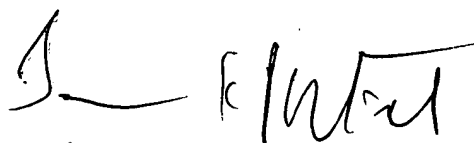
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Group Art Unit 2625

February 18, 2004



Jayanti K. Patel  
Primary Examiner